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OCTOBER, 1901.

No. 2.

THE AGRICULTURAL STUDENT



A MONTHLY MAGAZINE DEVOTED TO
AGRICULTURAL EDUCATION.

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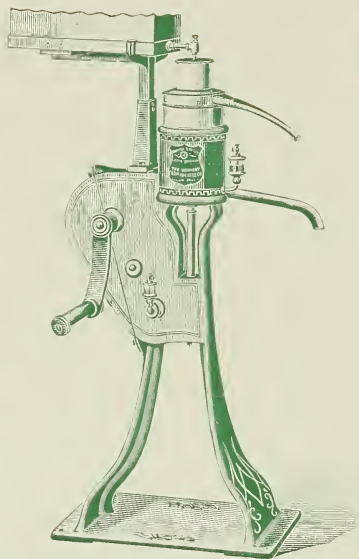
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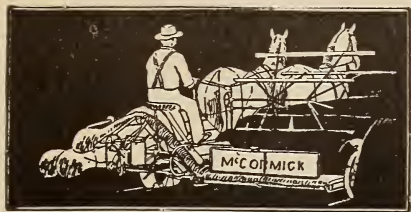
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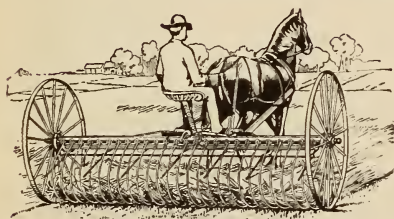
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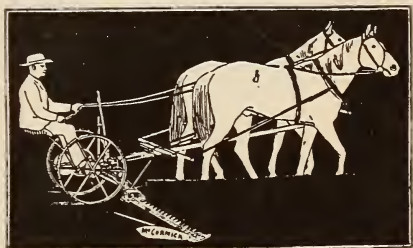
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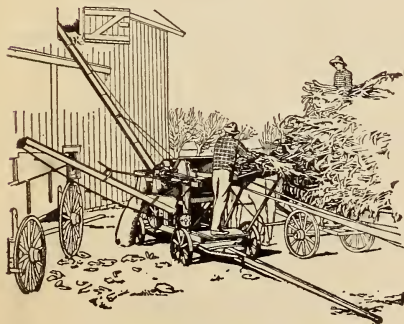
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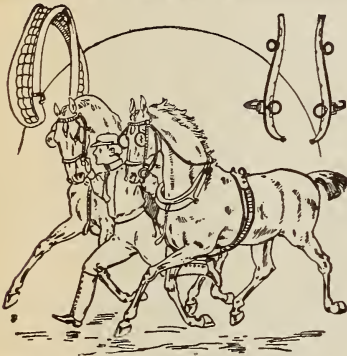
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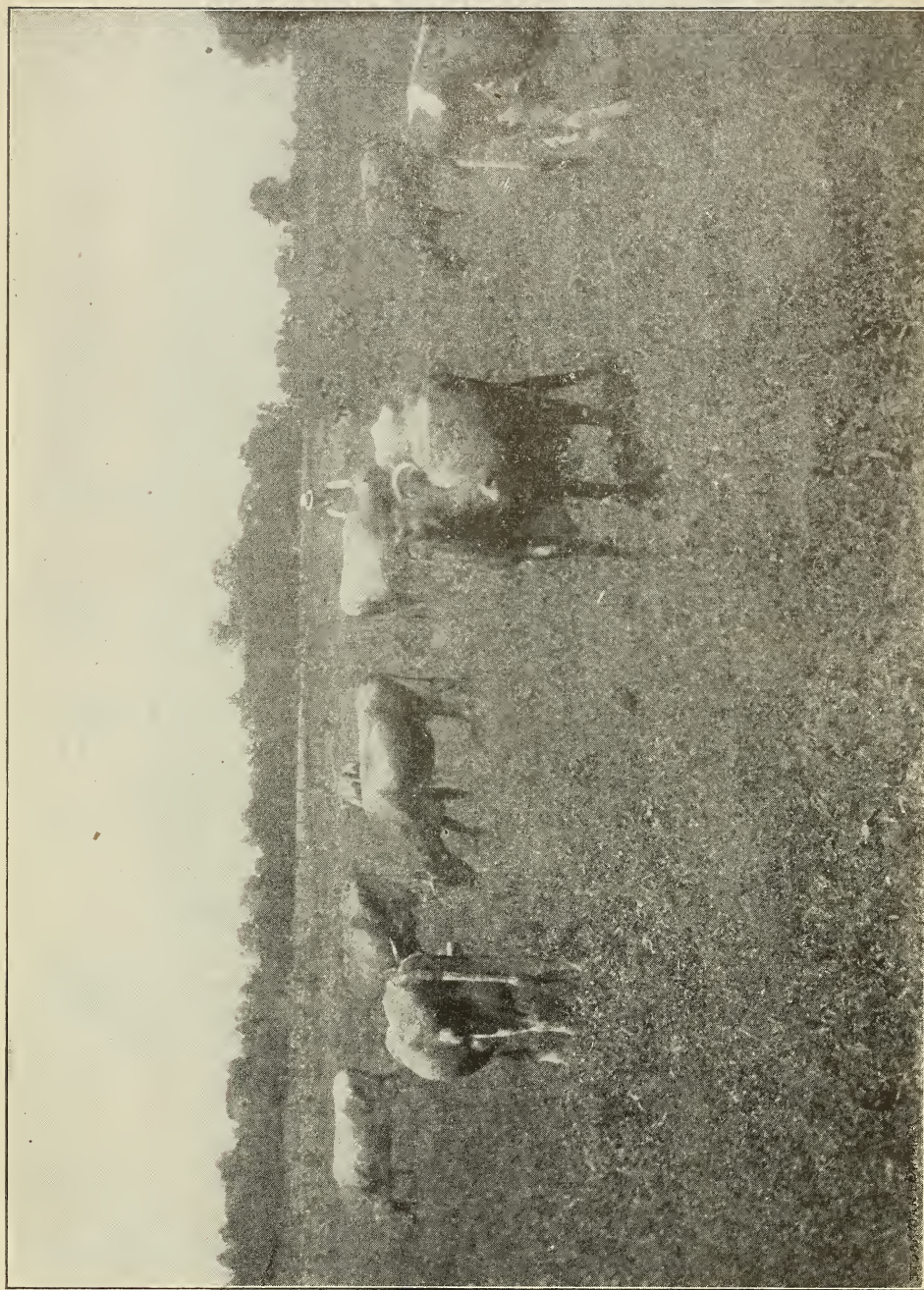
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THE OHIO STATE UNIVERSITY DAIRY HERD.

From The National Stockman and Farmer.

THE AGRICULTURAL STUDENT.

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EDITORIAL CHAT.

A great fault of the farmer is that he does not read enough, and is consequently behind the times. It is surprising how many farm homes may be found in which an agricultural paper is rarely ever seen, and an agricultural book a thing almost unheard of. No successful business man in any line thinks of doing without his trade paper, and if the farmer does so and fails, when they may be obtained so cheaply, he deserves little sympathy. To succeed in the present age, the farmer must understand, at least some of the underlying principles of agriculture, and the related sciences, and when good books and papers upon almost any subject can be secured for a mere nominal sum, there is no excuse for ignorance. The long winter evenings are close at hand when many hours could be profitably spent in learning more of the business in which you are engaged and at the same time broadening the mind in order to grasp greater problems that are sure to arise. Often the excuse is offered that one cannot buy all the books, and it is impossible to make a choice. While this may be true to a certain extent, after all, the main thing is to arouse the farmer and set him thinking, and with lists of the best books selected by various persons



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and published from time to time in the agricultural papers, little trouble should be had in selecting good books. Another mistake often made, is reading a little here and there, with no definite aim. Read exhaustively along some definite line, thus fixing the facts in the mind and getting the knowledge gained in condition to be useful.

Just a word to the students, both new and old along this same line. You will not find time to read even all the most desirable books along your line of study, to say nothing of many other books that every one should read. You should become acquainted with the books available on the subjects studied, however, so that should the time come when the information they contain is needed, it can be readily found. When possible to do so, two or three books, bought each year, supplementing the work done in class, will become familiar and found to be a ready help when wanting information quickly. By the senior year the nucleus of a good working library will have been accumulated and what is better, one with which the student is familiar enough to get ready benefit. Never will a better opportunity offer itself for the selection and comparison of books, and while the standard works of travel and biography should be found in every library, a selection of working volumes are of greatest importance.

Rural free delivery is proving a great boon to the farmers, and is being introduced very rapidly into every section of the country. New features are constantly being tried; arrangements have been made for the mail carts to display a set of weather signals on the sides of the vehicle each day, so they can be read a considerable distance from the highway.

We wish to call the attention of our readers to the page devoted to notices of new books, treating of horticultural or allied subjects. In this age of many books, few persons can afford to own all the books written, even on a single subject. It then becomes largely a question of wisely selecting a few volumes from the many. Science is constantly revealing new things and the books of yesterday are insufficient for the working library of to-day. Due notice will be given of new books upon the subjects above mentioned; stating as clearly as possible the contents and nature of the book with the hope that it may aid some one in securing the books they really desire and at the same time avoiding those which they can well do without.

Several new and much needed improvements are being made upon the University Farm. A new stave silo of 300 tons capacity has been built, making three in all now at the disposal of the dairy herd. A new tornado ensilage cutter with the blower attachment, has been added to the list of farm machinery. A new cow shed 116 feet long and 23 feet wide, is being built to the barn. The shed will be thoroughly modern in every way and together with the old barn, will furnish quarters for sixty cows. Some much needed repairs have been done on the horticultural greenhouses, which will greatly improve their appearance and efficiency.

Townshend Literary Society.

The society held its first meeting of the year Saturday evening, September 21, and elected the following officers for the term, as follows:

President, H. A. Clark; Vice-President, T. L. Wheeler; Secretary, C. C. Poindexter; Treasurer, M. O. Bugby; Critic, J. T. Dallas; Librarian, E. L. Zehring; Historian, T. W. Ditto; Ser-

geant-at-Arms, R. E. Walker; Executive Committee, C. C. Hatfield, L. M. Ruhlén, Modesto Quiroga.

The first regular meeting was held Friday evening, September 27, and the following program rendered:

Inaugural address by the President, H. A. Clark; Music, Coberly; Paper, Ather-ton; Reading, Hatfield; Music, Quar-tette; Impromptu Declamation, Wheeler.

The old men are taking up the work with a vim that promises well for the success of the society during the coming year. Townshend stands among the very first literary societies in the university, both in numbers and quality of work, and no agricultural student can afford to slight the opportunities here offered. It is to be hoped, therefore, that every student will identify himself with the society and take an active part. The good to be derived from the society will be limited only by what the student does for it.

The Asparagus Club.

The first meeting of the year was held Tuesday evening, October 1, in Horticultural Hall. Short talks were given by various members on the summer vacation and Mr. Wheeler gave the current horticultural news. For the benefit of new students, allow us to say that the society is entirely informal, there are no officers and no fees. By simply signing the roll book you become a member. The object of the society is the discussion of current horticultural subjects in a manner in which all may take part. All are cordially invited every Tuesday evening at 7 o'clock.

Agricultural College News.

Professor H. W. Munford, M. S., from Michigan, has been appointed Professor of Animal Industry in the University of Illinois, and Chief of Animal Hus-

bandry in the Experiment Station. He will have the entire charge of all animal husbandry work except the dairy cattle. Mr. J. H. Skinner from Purdue University, has been appointed assistant in Animal Industry under Professor Munford.

Professor W. J. Kennedy of the University of Illinois, has recently been elected to succeed Professor J. H. Craig in Animal Husbandry at the Iowa Agricultural College.

J. H. Craig, Professor of Animal Industry at the Iowa State College, has resigned his position and permanently retired from college work.

Mr. A. V. Stubenrauch, B. S., from the University of California, '99, and M. S. A. Cornell, '01, has been elected instructor in Horticulture and assistant in the Experiment Station at the University of Illinois.

J. C. Perry of last years' class is now in the employ of J. P. Hine; the well known breeder of Aberdeen-Angus cattle.

Merritt Harper of the class of '01, is pursuing post-graduate work in the University of Illinois.

A. H. Snyder who graduated from the agricultural course last June, is now student assistant in the Division of Horticulture, United States Department of Agriculture.

E. P. Sandsten, M. S., a graduate of the University of Minnesota, has been appointed assistant in Horticulture at the Maryland Agricultural Station, to succeed H. P. Gould, resigned.

H. R. Smith acting Professor of Agriculture in the University of Missouri, has been elected Assistant Professor of Animal Husbandry in the University of Nebraska and assistant in the same in the station.

The Colorado potato beetle has been found in various stages of development near Tillbury, England. The potato field was immediately surrounded and the crop

destroyed. England may now have just reason for becoming alarmed at the "American invasion."

Fully 10,000 peach trees are to be destroyed in Athens county by orders of the Experiment Station, as a result of infestation by the San Jose scale.

University Bulletins.

The Outlook for the Live Stock Industry in Ohio is the title of University Bulletin, No. 15. The article is by Professor Hunt and discusses the past and present history of the industry in the state, together with the possibilities of the future. The above should be in the hands of every cattle breeder in the state. Copies can be obtained by writing to Professor T. F. Hunt.

The address of Dr. H. L. Russell on The Bacterial Life of Milk, delivered before the Ohio State Dairymen's Association, has been neatly bound into a fifteen-page bulletin and is presented with the compliments of the Department of Agriculture. Dr. Russell is the authority upon this subject in this country, and what he has to say is well worth reading. Copies of the above may also be obtained by writing to Professor Hunt.

The addresses (seven in all) delivered at the dedication of the Agricultural Building, University of Illinois, have been bound in book form, and may be obtained by writing to the University authorities. These addresses are by the leaders in Agricultural education and will be of interest to every one.

The New Professors in the Veterinary Department.

Septimus Sisson, Associate Professor of Veterinary Medicine, was born in England, and received his preparatory education in King Edward's School, at Norpeth. He came to this country when he was fifteen years old and finished his

preparatory work in the South Side Academy, Chicago. Prof. Sissons is the seventh boy of a family of ten, one of his brothers, E. O. Sissons, now being Director of the Bradley Polytechnic Institute, and Assistant Professor in the University of Chicago.

Dr. Sisson received his V. S. from the Ontario Veterinary College in '91, and the S. V. from the University of Chicago in '98. From 1891 to 1898 he was Demonstrator of Anatomy in the Ontario Veterinary College. In 1899 he went to the Kansas State Agricultural College as Associate Professor of Veterinary Science and Zoology, and from 1900-'01 was Professor of Zoology at the same place. While connected with the Ontario College, Dr. Sissons competed for and received almost every medal offered. Success has followed him wherever he has gone, and the College of Veterinary Medicine is to be congratulated upon securing the services of a man so well fitted for his present duties.

Dr. Paul Fisher was born in Cincinnati, Ohio, and prepared for college in the common and high schools of his native city. He graduated in agriculture with the class of '91 at the Ohio State University, and the next year from the Veterinary College at the same place, and was immediately appointed Assistant in the last-named college. Dr. Fisher received a leave of absence and spent the year 1893 to '94 in Germany. While there he studied in the Royal Veterinary Colleges at Hanover, Berlin and Dresden, under Doctors Rabe, Koch, Schuetz and Johne. Upon returning to this country he served one year as Instructor in Surgery and Bacteriology, and in 1895 went to the Utah State Agricultural College, as Professor of Agriculture and Veterinary Medicine. In 1897, he went to Kansas State Agricultural College as Professor of Veterinary Med-

icine, and was appointed to his present position as Assistant Professor of Pathology last summer. The University is always glad to see her graduates succeed in after life, and especially so to have them back in their alma mater.

The University of Illinois.

The University of Illinois has again more than doubled the working force of its College of Agriculture and Experiment Station. Twenty-six specialists employed during the entire year give their exclusive service to agriculture, nineteen of whom give class room instruction, as follows:

Department of Agronomy—Fertility and Fertilizer, Professor Hopkins; Soil Physic, Mr. Know; Soil Bacteriology, Mr. Ward; Corn and its Culture, Mr. Shamel; Farm Crops, other than Corn, Mr. Bull; Farm Machinery, Mr. Crane.

Department of Dairy Husbandry—Dairy Cattle and Milk Production, Mr. Fraser; Manufactures of Dairy Products, Mr. Erf; Dairy Fieldman, Mr. Glover.

Department of Animal Husbandry—Beef, Cattle, Sheep, Swine and Feeding, Professor Munford; Horse and Live Stock Management, Mr. Skinner.

Department of Horticulture—Orchard Fruits and Orchard Management, Professor Blau and Mr. Stubenrauch; Vegetable Gardening and Small Fruits, Mr. Lloyd; Gardening under Glass, Mr. Beal.

Department of Veterinary Science—Diseases of Animals, and their Treatment, Dr. McIntosh.

Department of Household Science—Foods and their Composition of Foods, Miss Beatty.

The Principles of General Breeding and Lectures of Comparative Agriculture, Professor Davenport.

The college has never before been in a position to offer such superior advan-

tages to students, and it is pleasing to know that the public realize the fact. There are already 151 students registered in agricultural courses, and many more are expected before the close of September.

The University of Illinois at Urbana, Ill., opened this fall with a large attendance. Nearly 2,800 students have been registered up to the close of the week ending September 21. Sixty new men have been added to the force of instructors and several new departments have been created. A great many improvements have been made the past summer, and at present five new buildings are in the course of erection. These are as follows: A gymnasium, wood working building, hydraulics laboratory, chemical building and a water works plant.

The University of Illinois has taken some marked strides during the past few years and has developed into one of the foremost institutions of the United States. It is hoped that the progress will continue.

O. E.

The Student Judging Contest.

One of the novel features of the recent two weeks Ohio State Fair and one that attracted considerable favorable comment on the part of stockmen and visitors generally, was a live stock judging contest by twenty-six students of the Agricultural College of the Ohio State University, prizes having all been contributed by leading breeders of the state, as published in the September number of the Agricultural Student Magazine. The contest was conducted by Professors Hunt, Gibbs, Decker and Mr. Ruhlen of the Department of Agriculture of the University. The method of conducting the contest was to bring five animals of a given class into the ring and give the students thirty minutes to place first, second and third and write down their rea-

Ohio; fifth prize, G. F. Abbott, Medina postoffice, Medina county, Ohio. . .

Swine—First prize, Morris Churchman, Jerome postoffice, Union county, Ohio; second prize, W. B. Smith, Chesterhill postoffice, Morgan countfl, Ohio; third prize, F. A. Folsom, Franklin Furnace postoffice, Scioto county, Ohio; fourth prize, C. H. Case, Hudson postoffice, Summit county, Ohio; fifth prize, Merritt Harper, Grove City postoffice, Franklin county, Ohio.

The prize money will be distributed among contestants as follows: First prize, 25 per cent; second prize, 22½ per cent; third prize, 20 per cent; fourth prize, 17½ per cent; fifth prize, 15 per cent.

The prize winners are to represent the Ohio State University at the Intercollegiate Stock Judging Contest at the International Live Stock Exposition at Chicago the first week in December.

A Graduate Honored.

At the Pickaway County Republican Convention, held at Circleville, Saturday,



September 29, Renick W. Dunlap, Ohio State University, '95, was nominated for

representative. Mr. Dunlap owns and operates a fine farm near Kingston, one of the best farming regions of the state. Last winter, he was one of the state speakers at the Farmers' Institute and has been reappointed by the State Board of Agriculture for the coming winter. Last winter, he was elected for the third time President of the Kingston Farmers' Institute. He is chairman of the Township Republican Committee and Treasurer of the Republican County Central Committee. While in the University Mr. Dunlap was an excellent student and is well known in college circles, because of his brilliant football record.

The Making and Marketing of Swiss Cheese.

BY JOHN EYER, ALLIANCE, OHIO.

The demand for Swiss cheese has grown very rapidly in the last fifteen years. Twenty years ago, there were but few dairies in this country, operated on a very cheap and small scale, with but little demand.

Imported Swiss cheese, at that time, was handled extensively in all the large cities of this country; gradually the manufacturers have improved, which naturally increased the demand, until, at the present time it is much greater for the domestic than for the imported, and, I think, it is nearly as good, when properly made and cured. Much of the domestic Swiss is now sold for imported Swiss cheese, the buyer not knowing the difference.

I have manufactured Swiss cheese in Switzerland and also in Ohio, and I am sure that I have made, and have seen made, nearly as good cheese in Ohio as in Switzerland. The facts are that there is no State in the Union better adapted for the manufacture of Swiss cheese than the State of Ohio. Water and pasture seem to be particularly adapted to

the manufacture of this kind of cheese. I find that equally as good cheese is made on our clay soil where there is plenty of running water.

There are now some forty Swiss dairies in operation near Alliance, Stark County, Ohio, where I come from. Many of these farmers have clay soil, but have been very successful in this enterprise. Last year, the average price for their milk per hundred pounds was 95 cents from May 1st until November 1st—six months.

The way this business is handled, ten or fifteen farmers form into a company, select a site centrally located among them, build a factory and cellar; quite often a farmer among so many has a building and cellar suitable for the purpose, so, as a general thing, it is not necessary to erect a building expressly for the purpose.

The most essential feature is to hire a good Swiss cheesemaker, which can generally be secured in our section without much trouble. The expense of equipping a factory with everything necessary will not exceed five hundred dollars, where building and cellar can be had. Many of the farmers have cellars suitable for this purpose so that they seldom go to the expense of building a cellar. Also, some one among ten or fifteen farmers can convert some farm building into a factory, so that it is seldom that the expense of starting a factory exceeds five hundred dollars. The fact is that our farmers in this business are very prosperous. Nearly all of them in our section are engaged in this business for the reason, as before stated, that it is a profitable business.

They have no trouble in marketing their cheese. Buyers come to their factories and contract for their entire make during the months of July or August. As a general thing, there is no scarcity of buyers for this kind of cheese.

There are many farmers in our State who know but little about this business, and I think it would be to their interest to look into this matter.

I have varied considerably from the subject which was given me, which was the market standpoint. As stated before, the market for No. 1 domestic Swiss cheese has never been overstocked in my experience of over twenty years. Buyers, as stated before, go around to the factories and contract for the entire season's make, therefore causing the manufacturer no expense in marketing his cheese. After the contracts are made and the cheese selected by the buyer, great care should be taken in packing the cheese in good, strong tubs ready for shipping.

I should, at any time, be pleased to give any one all the information in my power. Come to Alliance and I will show you our factories and give you all the information possible.—Report Ohio Dairyman's Association.

The Restoration of Pasture and Meadow Lands.

The history of any agriculture is simply the rise and the progress of our race. In man's rise from the stages of barbarism and savagery, he associated himself with the tending of flocks and herds, agriculture in its elementary state consisting of feeding flocks and herds from pasture lands. Man's wants were at first supplied by killing wild animals and gathering fruits, the real natural products of the country. When this was no longer possible, animals were tamed and kept in herds. This is especially true of Asia and South America today, and to a greater or lesser extent has been the history of every country of the globe.

Our own agriculture has been somewhat different, especially in the eastern and southern sections of our land. Grazing over large areas is neither desirable

nor practicable. The so-called pasture lands of the eastern section of the country have resulted not because of an extensive use for grazing purposes, but from a bad practice of grain and hay farming that has left them unprofitable for longer use in this respect, so they have been relegated to the place of pasture lands, in New England especially, but throughout the country we find large areas, aggregating millions of acres of land, that are now used as pasture and meadow lands because they are no longer profitable for grain production.

Let us look at these old pasture and meadow lands in a plain, practical way. We find them worn out, depleted, and exhausted, and no longer yielding productive returns, yet, if these soils are examined by the chemist he finds large quantities of plant food in them; in fact, many of them contain quantities of each of the important elements for the production of maximum crops for many generations. The trouble is, the plant food exists in the soil in an unavailable condition, that is, the plant food can not be assimilated by the plant because it has not readily become dissolved by the action of soil agents. Nature's plan is to gradually and slowly but surely break up the chemical compounds in the soil so as to fit them for plant use. One of her most powerful agents is the air. Were you to completely exclude the air from the soil, it would be absolutely barren. There would be no changing of the elements of the soil into plant food going on in it. The elements of fertility are developed only when the air gets freely into the soil, and the more freely the air gets into the soil, the more the actual plant food is developed. Therefore, when the farmer puts on the plough and the drag and grinds this soil all to a fine powder, the finer the better, the natural law works, and the result will be the entering into the soil, through the air spaces or pores,

of the carbonic acid and ozone of the air, which will make plant food out of this soil when it would not otherwise be made. The plough and the harrow and the drag, then, are the basis of permanent improvement. Until the soil is fully stirred up and invigorated by this action, and until it becomes filled with organic matter, some outside help is indispensable for the greatest degree of success.

There are three elements that are necessary for plant development which are required in rather large quantities, and newly taken-up lands are usually deficient in these elements until Nature can be at work for some time to supply them in their usual and original way. Potash, nitrogen, and phosphoric acid, the three most important elements, because they are liable to be deficient in old lands, can be readily supplied in commercial forms. Extensive mines have within the last few years been discovered which contain immense stores of each that will supply these elements perhaps for centuries to come. The most prominent forms in which they are commercially used are for potash, muriate of potash; for nitrogen, sulphates of ammonia, or nitrate of soda; phosphoric acid; treated rock or acid phosphate.

In supplying this additional plant food for soils that are being restored and rejuvenated, from 150 to 200 pounds of muriate of potash, 100 to 200 pounds of nitrate of soda, and from 200 to 400 pounds of acid phosphate should be added per acre. These quantities will furnish the greater part of the plant food during the early stages of growth for pasture and meadow lands, so that there will not be too great a drain on the newly made available plant food.

If the physical condition of the soil is not improved through tillage and cultivation, the best results will not be obtained through the use of commercial plant food. There are large quantities

of commercial fertilizers used today, and much of their use is unprofitable, because the soil is not properly tilled and cultivated.

I cannot urge the importance of this physical improvement too much, for it is the first step in soil improvement, and the permanent restoration of pasture and meadow lands. In fact, diligent cultivation is absolute fertility. I have sometimes been quoted as unfriendly to the use of commercial fertilizers, but I am not, in any sense of the word. I believe the use of potash, nitrogen, and phosphoric acid, in their commercial forms, often prove unprofitable, but it is because the soil has been improperly tilled. When, however, the plough and the harrow are wisely and continually used, the commercial fertilizer can be used without fear, and it will prove itself to be one of the farmer's best friends.

The question of practical importance after knowing why we do a thing, is to know how to do it, yet this latter is the less important, because, if we know the theory, or the "why," the "how" to do will prove to be an easy thing to accomplish.

Every state in the Union has its depleted soils and worn-out pasture and meadow lands. Vast areas of this kind in the New England, Northern, Central, and Southern states are found to-day. We find the old pastures, fields, and the old unproductive meadows on every hand. How to restore their productivity is the practical question. During the past year, the writer received something like five hundred letters from farmers in New England states for information and suggestions in reference to this very important matter. In this article, it seems to me, I can do no better than to briefly describe our own method which we are following at the college farm toward improving our own pasture and meadow lands.

Some of this land had not been ploughed, perhaps, for a half century, and of course the pasture, grass, and meadow grasses had completely "run out," so to speak. Such lands are hard, cold, dead, lifeless. Clover and timothy and other grass no doubt made a great effort after a time to grow, but in the end ceased their struggle, and gave place to wild and natural plant growths. Nature, you see, was determined to have something growing for her own protection.

Our first step for improving these old lands was in the use of the plough. We plough, for convenience's sake, any time during the year, though our preference is fall ploughing. Do not make the mistake of ploughing too deep. Too much subsoil will be turned up if you do. A half inch of subsoil is sufficient, if your soil is very shallow. You will have to depend upon future ploughing to get the soil to a more preferable depth. We have some old pasture fields that are covered with stones. It looked a little foolish to attempt to plough in such fields, but we did, and the results have proved very satisfactory. A spring-tooth harrow was used to completely tear up and level the ploughed land. Not a tooth, I believe, was broken, even in stony fields. After the soil was fined, leveled as much as we could make it under the circumstances, we put on an application of commercial fertilizers in the following proportions per acre: Muriate of potash, from 150 to 200 pounds; nitrate of soda, 100 to 150 pounds, and acid phosphate, 300 to 400 pounds. This amount of fertilizer, when mixed at home, costs in round numbers from \$8 to \$10 per acre. The fertilizers were then harrowed in, and the seed applied. For pasture lands that are to be used as permanent pastures, that is, for eight or ten years before being ploughed again, we used the following combination of seeds: Red clover, 6 pounds; blue grass, 4 pounds;

red top, 4 pounds; white clover, 3 pounds; timothy, 6 pounds, and orchard grass, 4 pounds. This seed was evenly distributed, after a thorough mixing, and harrowed in with a light, fine-tooth harrow.

The fertilizers can be applied and seeding done either in fall or spring. If fall application and seeding are followed, it is advisable to use sulphate of ammonia instead of nitrate of soda, because the latter is so easily dissolved in the soil that much of the nitrate may be lost by leaching by fall and spring rains.

The first experiment of this kind which we tried was that of an old meadow field. Up to the time of the experiment the average yield was, perhaps, less than a ton per acre. The soil was clearly exhausted and depleted. A low place in the field was underdrained, and the whole of the field ploughed in the fall, after having received an application of ten tons of stable manure. In the spring the soil was thoroughly pulverized and fined by means of disc and spring-tooth harrow. It was then put to corn, and a fair crop of ensilage corn was harvested. Wheat was then sown and used for soiling and hay the following summer. The field was at once ploughed and harrowed, and early in September an application of 100 pounds of muriate of potash, 75 pounds of sulphate of ammonia, and 300 pounds of acid phosphate was added, and 10 pounds of timothy and 10 pounds of clover seed were sown and harrowed in. The following summer, the summer which has just passed, was very dry with us, and but a half crop was obtained throughout our section of the state, yet this old meadow, almost thrown aside, responded when fed and cared for with a crop of nearly two and a half tons per acre.

This is nothing unusual, but is simply what may result to ten farmers out of ten if the soil is studied and ploughed and

fed and cared for. Let us not abandon the old pastures and meadows, but treat them well, and they will do their full share in furnishing profits to the farm for our own comfort and enjoyment.—
Agricultural Education.

Changes in Dairy Methods.

BY R. A. PEARSON, ASSISTANT CHIEF OF
DAIRY DIVISION, U. S. DEPARTMENT OF AGRICULTURE.

The dairy industry has not been backward in making changes in the past few decades. This is a fact of common observation and it is plainly shown by statistics. In 1860, the cheese output of the country was about 100,000,000 pounds and only a small part of this was made in the five factories then in existence. It is estimated that the census just completed will show that the amount of cheese made in the United States has increased to 300,000,000 pounds, 85 per cent. of it being made in factories. Thus we see that in cheesemaking the change from farm factory methods has been almost complete. In 1860, the butter output was nearly 460,000,000 pounds, all of which was made on farms. It is believed the last census will show the annual output of butter to have increased to 1,400,000,000 pounds, one-fifth of which was made in factories. There is yet an immense amount of farm dairy butter on our market and much of it is sold at a low price, which means a tremendous loss to those who make it. High grade butter is made in some farm dairies, but a large part of farm dairy butter, packed in various forms, is purchased by dealers for renovation.

Every dairyman is more or less familiar with changes in apparatus and methods, which have been made in his own line of work. The method of buttermaking is being almost revolutionized by the centrifugal cream separator, the Bab-

cock tester, and now methods of ripening cream.

Besides showing changes in methods, statistics also prove that the industry has made a wonderful growth. It was but a few years ago that people thought good butter and good cheese could be made only in New York, Ohio, Wisconsin, and a few other districts. To-day butter and cheese are made in almost all parts of the country. The Pacific coast states, which formerly obtained their supplies from the east, now make nearly enough for their own use and during some months, export small quantities. Dairying is also becoming well established in the southern states, where it was almost unknown but a short time ago. What better evidence of this fact is needed than the presence at your meeting of Professors Scovell and Wing from Kentucky and Georgia, an important part of whose work is to give instruction in dairying?

Under special authorization of Congress and instructions from the Secretary of Agriculture, the Dairy Division has given considerable attention to the question, what shall we do with our surplus dairy products, which we will soon have if the industry continues to rapidly develop? The largest dairy market in the world is in England. That country purchases about 3500 tons of butter per week, the largest part and the best part of which is supplied from Denmark. Trial shipments of United States butter were forwarded to England at short intervals during the years 1897, 1898 and 1899. There was at first considerable prejudice against our butter. The Englishman had seen butter before from the United States and, judging from that, they believed we could not supply a high grade article. When the experimental shipments were discontinued in 1899 some of the largest butter merchants in England were thoroughly convinced that as fine butter can be made in the

United States as in any country in the world. Our butter was found to compare favorably with the Danish, and a part of it was sold at retail at the same price.

One of the important lessons learned by these experimental shipments is that butter for the foreign markets must be especially made for that market. Our supplies were obtained chiefly from two or three creameries, which received careful instructions at the time the shipments were commenced and changed their methods from time to time in accordance with criticisms received from our foreign correspondents. The English market requires butter having an exceptionally good body or texture, mild flavor, little salt, and little color. Two or three times the shipments from our western creameries failed to arrive in time to be forwarded from New York, and we substituted for that the best butter we could purchase on the New York market, paying an extra price for it. But this butter which was substituted and which would have given excellent satisfaction in New York was, in no case, considered the equal of what we had been getting especially made for the foreign market.

Some large companies are now arranging to regularly export butter of high quality, and there seems to be no reason to doubt that they will meet with excellent success.

Drs. Babcock and Russell, of the Wisconsin Experiment Station, have recently reported the results of some experiments on cheese ripening, which are of great interest to cheesemakers. For the past few years, it has been the custom of some commission merchants to hold cheese at a low temperature, and the advantage of doing this has been plainly shown by the two investigators named. It appears that the ripening of cheddar cheese is due to an enzyme, and this enzyme works at a low temperature, the same, except more

slowly, as at a high temperature. By ripening cheese in a cold room, therefore, undesirable changes due to bacteria may be avoided and the desired ripening change will proceed slowly. Knowledge of this experiment will be of especial use to the cheesemaker, who has had trouble with his curd and fears the formation of gas or other bacterial action in the cheese after it is taken from the hoop. By placing such cheese in a cold room for a month the bacteria will be killed and it can then be held at a higher temperature to hasten the natural changes caused by the enzyme.

In connection with butter and cheese-making, perhaps the greatest change of which we are in need is toward better methods of producing milk on the farm. It is well for the butter and cheesemaker to be thoroughly informed along all lines of dairying and closely allied subjects. I wish it were possible for every one in Ohio to take a full four-year course at this institution and obtain a thorough knowledge of the principles and practice of breeding, feeding, and caring for dairy cattle as well as the making of butter and cheese. But this is impossible, and I wish to offer a suggestion to those who are not in a position to give all needed instructions to their patrons. It would be well for the factory man to subscribe for a number of good dairy periodicals and to obtain a small supply of bulletins on dairy subjects. The former can be had at small cost and the latter are free. These should have parts, which might be of special help to patrons, marked to attract their attention and then they should be handed out with the request to read the marked sentences or paragraphs. A farmer will be ten times as liable to read printed matter given to him in this way as he would to hunt through a number of pages or columns for the part which would especially interest him.

With a few notable exceptions, there has recently been but little change in the method of supplying milk for city use. We think that the system of supervising city milk supply, as followed in some cities, is radically wrong. Milk consumers are often informed through the public press that certain dealers have been prosecuted for selling adulterated, preserved, or otherwise impure milk and they get so much information of this kind that they are led to believe that milk is a dangerous article of food and should be avoided as much as possible. It seems to us entirely practicable to give prominence to the well-conducted dairies so that the public will also be occasionally reminded that it is possible to obtain pure milk. And in doing this, it is not necessary to lessen the vigilance over the dishonest dealers.

There is coming a decided change in the whole character of dairy work. Every year dairymen, and butter and cheese-makers are becoming better posted, and no cause is working to this end with better results than the dairy associations and schools. The dairymen of Ohio are to be especially congratulated upon their strong and active Association and their well-equipped Dairy School, with its corps of most efficient professors and instructors. These agencies, which are similar in influences in other states, are helping to lift the profession to a more dignified position than it has held.—Report of the Ohio Dairymen's Association.

Nansen's Important Article.

In an early issue of the Saturday Evening Post, Doctor Nansen, the eminent Arctic explorer, will describe the various pole-seeking expeditions of the year. The importance of this paper lies in the author's comments, and his predictions as to the success of the different parties.

Farm Butter Making.

MRS. J. H. GLICK, CIRCLEVILLE, OHIO.

Having been a town girl and a teacher I might give many funny experiences connected with my first attempts at milking and butter making. I was not quite as ignorant as the city girl who supposed that the farmers kept a cream cow, a milk cow and a butter cow, but nevertheless a cow was to me a most formidable creature—if she but moved her foot I was up and away, and oh! how long it took me to learn to milk. How the milk would persist in spraying all over me—up my sleeve, on the ground, anywhere but in the bucket. But enough on this point.

When we consider the amount of poor butter that is made and placed upon the market, we may well conclude that farmers are in need of a better education along dairy lines. Dairying, like any other business, in order to be made a financial success must be managed with business foresight; it must be studied; it needs the application of business methods; thoroughness, cleanliness, regularity and many other points are essential. With all these if we expect to make dairying a specialty we must have something else—we must have the dairy cow; and one that converts her food into good flavored milk, rich in butter fat. As dairy products during the last few years have declined in price, and competition has become sharper, it behooves us to have better cows, and more than ever before, cows that are capable of yielding a profit over the cost of production; and having these we must put in practice new and careful methods in order to keep step with our more successful neighbors. It will not do to blindly follow the good old ways of our grandparents. They were good enough fifty years ago, but they will not answer now.

THE FIRST ESSENTIAL.

The prime requisite in making good butter is scrupulous cleanliness, which must begin at least as far back as the food of the cows, the water they drink, the air they breathe and the place they live in.

Butter is an oil, and like most oils highly absorbent of what we call odors and flavors. If these are once absorbed it is impossible to get rid of them. The only thing to do is to prevent them absolutely. This may seem to most farmers a small thing to fuss about, but care or neglect in this matter is the principal reason why the butter from some dairies brings from twenty-five to thirty cents a pound when other butter made from the same breed of cows, on the same feed and by the same method brings only ten and twelve. I would advise no one to attempt to make butter dairying a business who is not willing to look close after every detail—from selecting his cows to the marketing of his butter. Unless he does this his profit will be small. Butter making like a great many other industries has a good deal of hard work connected with it. To be sure we have a great many modern improvements, yet with them all there is a great amount of hard work in making good butter. There is no part of the work that can be slighted, in fact there is no work on the farm that is quite so exacting as milking and taking care of milk. Cows to do well should be milked at regular hours and always by the same milker if possible, as a change of milkers often reduces the quantity as well as the quality of milk. The milking should be done quietly, without sudden word or action. Certainly there should be no loud talking, shouting, or singing; and no one who is disliked by the cows should ever be allowed to milk. As an inducement for a cow to give down her milk it is not a

good plan to caress her with the milking stool, or the handle of a pitchfork. The hands of the milker should be dry and clean. I consider it just as uncleanly to milk in the morning with unwashed hands as it is to get breakfast with them unwashed. Before beginning to milk the cow's udder should be brushed clean of all loose dirt, and often washed and wiped if necessary. The milk should be strained and kept in a separate building, when possible, because of the great difficulty in preserving the milk from odors in a room devoted partly to other purposes. We have our strainers made with an extra ring and use a double thickness of cheese cloth over the strainer proper.

A SMALL HERD.

We do not make dairying a specialty, but consider it one of the side issues of the farm from which we derive some pin money.

We keep a small herd of from ten to fifteen cows—all Shorthorns. They are stabled at night and on cold stormy days, and are milked in the stable summer and winter. Their feed from October until they are turned on grass is ensilage and bran, with corn fodder fed in the lot. They have access to salt at all times and plenty of fresh water from the well. There is a great difference between making butter now and making it under the old process. When we first began to make butter we used crocks to strain the milk in, and it took about half the time to scald crocks and scour lids. We now use the Cooley creamer and save all this labor, and we think get much better results. We have used one for more than ten years and would not like to think of going back to the old way. The water for the cows is pumped with a wind pump and runs through the creamer, insuring an abundance of fresh water for the milk. The milk is drawn by means of faucets

and the cream can be skimmed either at top or bottom. In summer the cream is kept submerged and churned when the can is full. In the winter the cream is skimmed sweet and is gathered in a large can made for that purpose holding six or seven gallons and is kept cold in the milk house without freezing until the can is full. It is then brought in and set in a pan of hot water to ripen. A half pint of buttermilk for each gallon of cream is added to hasten the process. By stirring constantly the cream is not injured by raising the temperature up to 70 or 80 degrees. By an arrangement we have for cooling the cream we churn at 58 degrees in the summer time. We do not use ice, but cool it with fresh water from the well. We have never tried to reduce the temperature lower than this, because butter churned at 58 degrees is solid enough to work in rolls, if churned very early in the morning and worked away without being exposed to the air.

MANAGEMENT OF THE CREAM.

There is such a difference in the management of cream, and I think more butter is spoiled before it reaches the churn than after it gets into it. While two butter makers may from the same lot of cream bring forth vastly different results, yet it is absolutely impossible for any butter maker, no matter how skillful she may be, to make a superior quality of butter from an inferior quality of cream. And right here is the point where I think so many make a failure. They think it makes no difference whether they churn today or tomorrow; they let the milk stand too long before skimming, or the cream stand too long before churning, or it is too warm and the butter is white and soft, or it isn't half worked and a great deal of buttermilk left in, salted too much or too little, any one of which is injurious to the production of a fine

article. You might, without much loss, neglect your cows and delay feeding and watering for a few hours—but you dare not neglect your cream even for a few hours, when once it is ready to churn. We read that it is the “little foxes that spoil the vines;” consequently if we want to make a good article that will command a good price we must pay strict attention to these little things, allowing no other household duty to take precedence where it can be avoided. Skimming the milk, preparing the cream for the churn, salting, working and packing the butter, I always prefer to do myself, seldom trusting it to others. We always use a thermometer to test the cream before churning; in fact, we consider a thermometer indispensable in making butter. There are still thousands of butter makers who do not use this necessary implement; they have been “brought up” to do without it and they think it all right to guess at the temperature. If occasionally they have to churn four or five hours before the butter comes, why they always have a reason to give for it, but never the right one. Fifty cents worth of glass and mercury put together properly will save that many dollars worth of time and butter quality in the course of not many years.

It is remarkable how some women are able to get the cream at about the right temperature without the use of a thermometer—it is a kind of dairy instinct, but more fail than succeed at such guessing and the butter market shows the result. What a nasty mess is butter that has been hours in churning, gathered with the buttermilk all in it, and then worked with the bare hands. How many tons of such stuff are sold every year, and how the maker of it will get miffed if you intimate that it is not first-class. Temperature has much

to do with nearly all farm operations; in many of them we can't control it no matter how much we may wish to—but when it comes to the temperature of cream for churning, when the temperature is all important, why not regulate it with the certainty that the thermometer gives?

THE CHURN AND CHURNING.

We use the barrel churn without any dasher, and practice what is called the “granular method” of making butter—that is to stop churning when the butter gets about the size of grains of wheat—draw off the buttermilk, and put in fresh water, churn a few minutes and then draw it off. Some wait until the lumps of butter get the size of hickory nuts, but it is just as well, if not better, to stop when they are a little larger than wheat. The whole object of either working or washing is to get out the buttermilk, and when it is washed out it is obvious that the smaller the grains of butter the better the chance of washing out all the milk. If you have never tried the granular method why not give it a trial and see for yourself its merits, and its demerits, if you can find any. If you have not tried this method it will require close watching to stop churning at the right time. After the cream gets thick and begins to “break” is the time to look out for the butter granules.

WASHING OUT FLAVOR.

After drawing off the buttermilk we again come to a point where there is a difference not only of opinion but of practice. Some pour in more water and after a few revolutions of the churn draw it off and repeat the process until the water is perfectly clear; while others claim that the flavor may be washed out, and wash as little as possible. Some excellent butter makers that I know never wash their butter at all. The flavor is an integral part of

the butter and can no more be washed out than the sweetness can be washed out of sugar. If you do not believe it feed the cows a mess of onions and then try to wash out the flavor.

There are many ways of salting butter, but for granular butter I think that dry salting is the least trouble. Nearly all methods have much that must be left to the judgment of the maker, as the amount of water that is left in must always vary a little, so perhaps I will not be judged too harshly when I say that I never weigh the salt. Since using the barrel churn we have discarded the use of butter bowl except for the winter butter when it is used simply to shape the rolls. Much of the working can be done in the churn with the paddle, but we use a butterworker which makes the work much easier. The object of working the butter is to expel the water and this should be done by direct pressure, never by a sliding motion of the lever as this will destroy the grain. We begin to use butter color as soon as the cows are taken off of grass and keep the butter a uniform color throughout the year. Every consumer wants butter of good color all the time. If it is white in winter it does not taste so good, because it does not look so good.

Color the butter to suit the market, and put it in with a clear conscience, for there is no deception or fraud about it, it is simply making it more attractive to the eye. We sell our butter to private customers, and furnish it as fresh as possible; give liberal weight and cheerfully humor any peculiar ideas about saltiness or color. The buyer has a right to have his taste consulted.

There will always be plenty of prompt paying customers in our cities and towns who will take all the really fine butter that will be made, for it is a lamentable fact that the majority of farmers and farmers' wives are so blind-

ly egotistical that they will never learn to make other than "grocery butter" which even at the low price paid for it sells for more than it is worth. Butter made in the manner described, from cows in perfect health, well fed and watered, with scrupulous care and cleanliness should smell like the June clover fields and taste like the nectar of the gods!—Report of the Ohio Dairymen's Association.

Storing Fruit and Vegetables.

It is now coming the time of year when farmers and gardeners are thinking of methods of storing fruit and vegetables. The ordinary cellar under a part of the house is not an ideal place to store all sorts of orchard and garden produce, either from the standpoint of the health of the farmer and his family or the good of the stored material. The cellars are nearly always too warm, and often too damp, which hastens rather than retards decay, and this mass of decaying vegetable matter is very liable to breed the germs of disease, which may be carried to the occupants of the rooms above. A separate building for this purpose would be found much more satisfactory and economic even on most small farms. The following from a bulletin of the Cornell Experiment Station, contains some excellent suggestions, covering most of the points to be desired is a building of this sort.

"A fruit house should be so constructed as to preserve an even temperature. Storage houses are of two types. First, those which modify, but do not regulate extremes of temperature, and second, those which furnish definite low temperatures. Houses of the first class are generally within the means of the commercial fruit grower. Those of the second belong to the equipment of the fruit dealer.

"The ordinary storage house is probably a frame building provided with a

well-drained cellar, and having perfectly insulated walls and double doors. Insulation is secured by providing two or more air spaces in the walls. These air spaces should be separated by paper-covered partitions.

"Comparatively low temperature in these buildings may be secured in the fall by keeping them tightly closed during the warm part of the day and ventilated only on cool nights. Fruit houses of this character will keep out frost, so that the grower may hold his fruit till a favorable opportunity for selling occurs.

"Dry air prevents the growth of fungi, but causes the fruit to shrivel; a moist atmosphere on the other hand preserves the plumpness of the fruit, but encourages the development of parasitic plants. Extremes should be avoided.

"The principal thoughts for the fruit grower to keep in mind in handling his fruit are that it is a perishable article, that its keeping season may be lengthened by careful handling and by low, even temperature, and that profits may be increased by placing it on the market in an attractive form."

Book Reviews.

The Feeding of Animals by W. H. Jordan, Director of the New York Agricultural Experiment Station. The MacMillan Co., 450 pp. Price \$1.50.

This is published in the Rural Scientific Series, edited by Professor L. H. Bailey, and in our opinion is the best book yet written on the subject for the general reader or practical farmer. The book will doubtless also find its way into the class room of many of our agricultural colleges, where there has been a long-felt want for a satisfactory textbook on this subject. It is written in a clear, interesting and forceful style, and while it deals with all the principles of the subject, so far as known at the present time, it omits much of the details and mere exposition of feeding formulas that has made most previous books tedious to the general reader, and heavy for class room work. With both the student and the farmer interested in the care and maintenance of live stock, the book certainly has a place.

Flowers and Ferns in Their Haunts, by Mable Osgood Wright, 58 full page and 118 text illustrations. The MacMillan Co., New York, 360 pp. Price \$1.50.

As the author says in the "invitation," the viewpoint in "the flowers in the landscape" and certainly no one can read the book without feeling that the author possesses a deep love for nature and a ready appreciation of the pictures which the Creator has placed in every corner of the earth. The style is a happy combination of description and narrative; clear, forceful, fascinating. At the very beginning of the book, the author introduces the reader to "Time O' Year," "Nell" and "Flower Hat," and makes him one of the party in their long tramps afield, through woods and along the running streams. The description of the flowers and vegetation characteristic of each season, from the appearance of the first flowers of spring, until the last fall plants have surrendered to Jack Frost, are veritable word pictures. No one can fail to find the work interesting and instructive.

The Insect Book, by Dr. L. O. Howard, chief of the Division of Entomology, United States Department of Agriculture. Doubleday, Page & Co., New York, 429 pages, over 300 illustrations. Price \$3.00, net.

The book is a popular description by the foremost authority of the country on bees, wasps, ants, grasshoppers, flies and other North American insects. The author has departed from the beaten path usually followed by writers upon similar subjects. First, a vast, but somewhat neglected group of insects is dealt with, and second, especial attention is given to the life histories of the insects in the various groups studied. The book cannot help but interest all readers and create a thirst for a deeper knowledge of Nature and her mysteries. Directions for collecting and preserving insects are clearly given; complete systematic tables of the larger groups are given and last, but not least, a complete bibliography of all literature on these groups of insects.

Mr. Rudolph Hirsh has been appointed Laboratory Assistant in Agricultural Chemistry.

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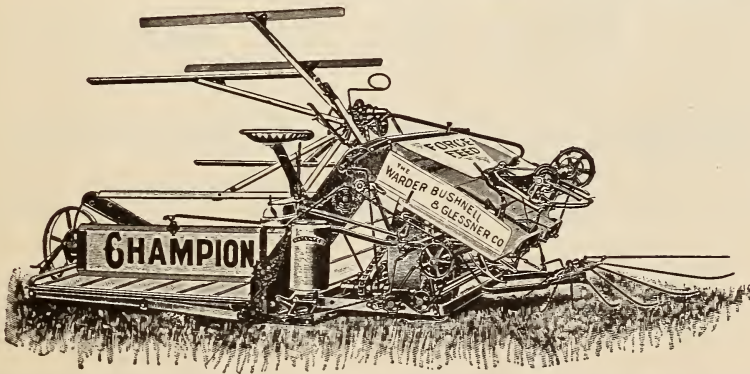
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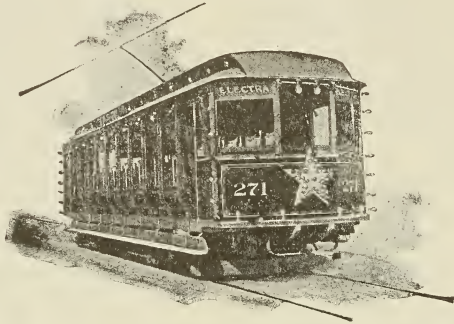
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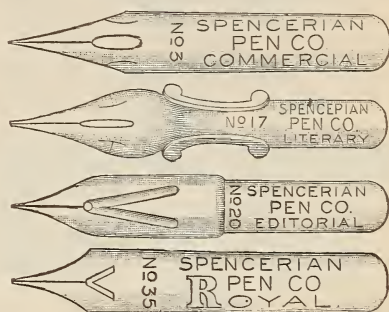
The Business Side of a Great University, by President Harper, of the University of Chicago, is the opening article in the College Man's Number (October 12) of THE SATURDAY EVENING POST, of Philadelphia.

Theodore Roosevelt, Harvard, '80, is the title of an entertaining paper on the President's college life, by his friend, Owen Wister. Other strong features of this number are short stories by Max Adeler, Jesse Lynch Williams and Frank Norris, and a page of droll "Nature Studies" by Oliver Herford.

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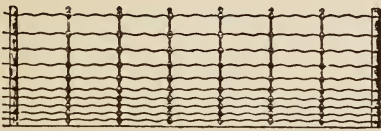
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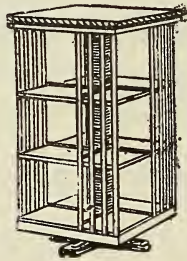
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